

REMARKS

Claims 1, 2, 4-12, 14-21, 23-29 and 31-36 are pending.

Applicants acknowledge the Examiner's maintained rejection of claims 1, 2, 4-9, 11-12, 14-21, 23-29 and 31-35 as being unpatentable because of alleged obviousness-type double patenting in view of co-owned U.S. Patent No. 6,239,298. Applicants respectfully traverse this rejection, based on the differences in structure and surprising oxidative stability of the 'first moiety' and the products formed from the respective 'first moiety' with the second and third moieties, which result in differences in structure and utility of the products as discussed in detail herein.

Applicants thank the Examiner for acknowledging that claims 10 and 36, while objected to as being dependent upon a rejected base claim, would nonetheless be allowable if rewritten in independent form including limitations of the base and intervening claims. Applicants respectfully traverse this objection based on Applicants' arguments with respect to the Examiner's rejection of claim 1.

Applicants thus contend that all claims are allowable as presently presented.

No new matter has been added.

Nonstatutory Double Patenting Rejection

The Examiner has maintained the rejection of claims 1, 2, 4-9, 11, 12, 14-21, 23-29 and 31-35 as being unpatentable because of alleged obviousness-type double patenting in view of co-owned U.S. Patent No. 6,239,298 ('298) (Office Action of 25 January 2007, at page 2). The Examiner urges that while the claims are not identical, they are not patentably distinct. That is the Examiner is suggesting that the differences between particular present claims and particular claims of the patent are obvious in view of the patent claims.

Specifically, the Examiner asserts that "the claims are not patentably distinct because the first moiety of the present invention encompasses the first moiety of the patent." Specifically, the premise of the Examiner's contention is that "the unsaturated *synthetic* base oil of the present

invention encompasses the unsaturated triglyceride plant oil *thermal* polymers as set forth in the patent” (*Id.*, emphasis added). Simply stated, the Examiner is urging that ‘thermal polymers’ (telomers) of natural plant oils are encompassed by the ‘unsaturated synthetic base oils’ of the present invention.

Applicants respectfully maintain the traversal this rejection, because the Examiner’s premise is not supportable; that is, natural plant oils are not encompassed by the ‘unsaturated synthetic base oils’ of the present invention. The instant *first* moieties are distinguishable from those of the ’298 patent, as are the reaction products thereof with the second and third moieties, and, in fact, this is particularly true in the case of the *thermal* polymers cited by the Examiner. Moreover, these differences result in fundamental, non-obvious differences in product utility because of differences in, for example, oxidative stability.

First, the ‘unsaturated synthetic base oils’ of the present invention are just that—synthetic, whereas those of the ’298 patent are natural plant oils and thermal polymers thereof, and such thermal polymers are not included in the polymers recited in the instant specification. Specifically, the unsaturated synthetic base oil of the present invention is broadly described at page 8, ll. 1-19, and the word “polymer” is specifically used at page 8, lines 4-6, reciting that the first moiety includes the synthetic unsaturated liquid oligomers and polymers such as unsaturated polyalphaolefins, polyacrylates or dehydrated polyolesters. Thermal polymers of natural plant oils are not included and are therefore not encompassed within the first moiety definition of the instant specification.

As previously discussed, the ’298 patent relates to fuel lubricity additives, and recites and claims the use of an “unsaturated triglyceride plant oil or a thermal polymer thereof” as a *first* moiety, whereas the claims of the instant application recite use of “unsaturated synthetic base oil” first moiety, and to the extent that polymers are included as ‘first moieties,’ they do not encompass thermal polymers of natural plant oils. Indeed the working examples (*e.g.*, Examples 2 and 3) of the present invention actually serve to **contrast** exemplary synthetic base oil-derived products from those based on naturally occurring plant oils. Thus, the entire thrust and teachings of the instant

specification, including the working examples not only do not support the Examiner's premise as described above, but profoundly *teach away* from the Examiner's urged premise.

Second, because naturally occurring plant oils are typically heterogeneous with respect to carbon chain length and degree of unsaturation, the *first* moiety unsaturated triglyceride plant oils of the '298 patent (e.g., tung oil, rapeseed oil, soybean oil, etc.) are typically heterogeneous and comprise more highly polyunsaturated (e.g., including polyene) fatty acids chains such that the resulting *first moiety-second moiety* products, and the subsequent products with *third* moieties are correspondingly heterogenous and more highly polyunsaturated compared to the instant synthetic base oil-based products. For example, Figure 1 of the '298 patent (attached hereto as APPENDIX A) shows a product of rapeseed oil, maleic anhydride and trimethylolpropane that has polyunsaturated carbon chains, and five (5) double bonds. Furthermore, because of the heterogeneity of polyunsaturation of such natural oils, other significant products present from such rapeseed oil reactions would have an even higher number of double bonds. By contrast, the exemplary TMOSS, made from an unsaturated synthetic base oil (trimethylol propane trioleate) is relatively unsaturated; APPENDIX B, attached hereto, shows the Trimethylol Propane Trioleate cycloaddition product with sorbic acid, to produce a product that has only two (2) double bonds.

Significantly, according to aspects of the present invention, the higher degree of unsaturation in the products derivable from the heterogeneous naturally-occurring plant oils, results in substantially lower oxidative stability (as can be measured by Iodine No. or oxidation studies). Indeed, as taught and confirmed in Examples 2 and 3 of the instant application, TMOSS (made from an unsaturated synthetic base oil) is as effective at preventing wear as the additive made from soybean oil, but is much more stable in high temperature, oxidizing conditions, as would be found in an engine crankcase. "The high stability is shown by the virtual elimination of the sludge that precipitated from the soybean oil-based sample"; "99.8% less sludge with TMOSS" (see Specification at page 13, lines 31-36). Applicants contend that such surprisingly enhanced stability, confirms that the present claims (and the first moieties recited therein) are not, and can not possibly be *obvious* in view of those of the patent.

Third, and contrary to the Examiner's assertion, the case with respect to thermal copolymerization, as well recognized in the art, is even more distinctive, because thermal copolymerization of vegetable oils is accompanied by significant cross-linking of the unsaturated sites of the carbon chains and would produce vastly different products with distinctive molecular weight, viscosity, and properties, relative to the instant products.

Therefore, applicants respectfully disagree with the Examiner's premise that "the unsaturated *synthetic* base oil of the present invention satisfies the unsaturated triglyceride plant oil and thermal polymers thereof of the '298 patent." This is simply NOT true, in view of Applicant's description of the instant first moiety as described above, and based on the specification data in the working Examples that confirms the fundamental differences between the two distinguished classes of base oils.

Applicants have, nonetheless, amended claims 2, 12, 21 and 29 to facilitate prosecution further clarified the claimed subject matter by replacing the phrase "unsaturated liquid oligomers and polymers, unsaturated polyalphaolefins, unsaturated polyacrylates, unsaturated dehydrated polyol esters," with "unsaturated polyalphaolefins, unsaturated polyacrylates, unsaturated dehydrated polyol esters...." Support for this amendment is found throughout the originally filed specification, and particularly, as described above, at page 8, ll. 4-6. No new matter has been added. The amendment serves to clarify that thermal polymers of naturally occurring plant oils are not encompassed under the synthetic base oils of the instantly claimed subject matter.

Applicants, therefore, respectfully request withdrawal of the Examiner's rejection based on obviousness-type double patenting.

Claim Objection

Claims 10 and 36:

Applicants acknowledge the Examiner's objection to claims 10 and 36 as being dependent upon a rejected base claim. . Applicant's arguments and amendments of the claims with respect to the Examiner's non-statutory double patenting rejection obviates this rejection.

Applicants, therefore, respectfully request withdrawal of this rejection.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request entry of the present Response and Amendment, and allowance of all claims 1, 2, 4-12, 14-21, 23-29 and 31-36. The Examiner is encouraged to phone applicants' attorney, Barry L. Davison, to resolve any outstanding issues and expedite allowance of this application.

Respectfully submitted,

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